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Graduate Dental Students Self-Assessment in Oral and Maxillofacial Radiology Competencies

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Abstract

In this study, competencies of graduate dental students of Babol University of Medical sciences were analyzed. This cross-sectional study was recruited among graduates of dentistry, from Babol University of Medical Sciences during 2012-2013. Sixty three students participated in this study consisted of 37 men (58.7%) and 26 (41.3%) women. 4 students (6.3%) obtained GPA (average score out of 20) lower than 14, 48 people (76.2%) obtained GPA of 14 to 17 and 11 people (17.5%) had a GPA over 17. 29 people (46%) were graduated in 2012 and 34 people (54%) in 2013. The students obtained the maximum score in intraoral radiography particularly periapical radiography and manual X ray film development and, and obtained the minimum score in being knowledgeable of extra oral radiography techniques, occlusal radiography procedure, digital sensors of intraoral radiography, exposure time for bitewing radiography from different maxillary areas, interpretation of lesions based on radiographic radiolucent appearance, radiopaque, radiolucent-radiopaque lesions and their differential diagnosis. Male graduates obtained a score higher than female graduates for placing the film in correct positioning bitewing radiography ($p=0.03$).

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The group with GPA of 17-20 significantly obtained higher score in questions related to technical errors in intraoral radiography, interpretation of lesions and their differential diagnosis. This study indicated that self-assessment results of Babol College of Dentistry graduates in relation to oral and maxillofacial radiology were satisfactory in technical skills and graduates of higher GPA obtained better results for interpretation of lesions based on radiographic radiolucent view as well as differential diagnosis of lesions, but gender didn't affect in results.

Keywords: Self-Assessment; Graduate; Dentistry; Oral; Maxillofacial Radiology

1. Introduction

Great mission of higher education institutions are trained efficient, skilled and committed manpower to solving people's needs, special position of this centers of science and technology in society, becomes more and more apparent every day. In this regard, a student who wants to learn the knowledge has great role in promoting this worthy goals of the university. To achieve this goal, students must be trained based on new, correct and standard procedures, and relying on the scientific principles. Self-assessment of dental skills is complementary methods for developmental evaluation at the end of the course. Competence in dentistry is including expected professional behavior (standard) that dentist can do independently when faced with patient problem [1]. This professional behavior is an integration of knowledge, skills and professional values that is shown simultaneously in field of dental services and tailored to the location. Educational programs of dental schools help students to obtain technical and clinical skills which needed for dental services. It can be said confidently that the acquisition of clinical skills is one of the most important factor for dentist elements of competency [2,3]. The main question that policy makers faced for training human resource in the field of oral health is that dental school graduates have competencies and needed skills to provide dental services. These graduates must be trained in knowledge, behavior and attitudes aspect which related to oral health that they can provide services with expected quality in clinics, polyclinics and their private offices after their graduating [4,5].

Since, one method of lesions detection and oral and dental diseases, is maxillofacial radiography, so dental students should be familiar with intraoral techniques and how to do it and also they must be can interpreted the maxillofacial radiography well. Types of performance assessment include an evaluation by supervisor or administrators especially middle managers, self-assessment, evaluation by colleagues, evaluation committee, evaluation and assessment by subordinates and inspectors. Approaches to self-assessment included a questionnaire approach and the workshop approach. Benefits of using self-assessment questionnaire are including speed and ease of use, learning, ability to design a specific question and possibility of receipt feedback separately from each part. Nowadays the importance of self-assessment in monitoring, improvement and development of the educational programs have been proven [6]. Considering that of measuring students' views is necessary and effective pillars in evaluating the applicability of theoretical lessons and measuring quality of education through evaluating the medical students' opinion in introducing the strengths and weaknesses of this approach. Hence, we decided to study the capabilities of Babol dental graduates in the field of oral and maxillofacial radiology.

2. Methods and material

In this cross sectional study, the evaluation of PhD dentistry graduates was performed in the field of oral and maxillofacial radiology in Babol dental school. Inclusion criteria for this study were graduating in 2012 and 2013. The study was done through census sampling method and includes all graduates of these two years. The information was obtained by a questionnaire with 26 questions. These questions were including the basic skills needed for a dentist in the field of oral and maxillofacial radiology. Of the returned questionnaires, completed questionnaires have been selected for study. The questionnaire consists of 2 parts: The first part contains information about gender, year of graduation and total GPA and the second part contains questions about self - assessment about capabilities of graduates in the field of oral and maxillofacial radiology that was approved based on educational curriculum. The validity of questionnaire was reviewed and approved by 3 of the masters of radiology department of oral and maxillofacial school of dentistry of Babol and reliability of questionnaire was calculated by pilot projects among 10 students using Cronbach's alpha coefficient ($X: 0.848$). The analysis of information was performed using SPSS version 18 software and statistical tests such as t-test and one way-ANOVA and post-hoc tukey. Significance level was considered as 0.05.

3. Result

The number of participants in the study were 63 persons, 37 persons were male (58.7%) and 26 persons were female (41.3%). The grade point average (GPA) of 4 persons (6.3%) was less than 14, 48 persons (76.2%) was from 14 to 17 and 11 cases (17.5%) was over 17. 29 cases (46%) were graduated in 2012 and 34 persons (54%) graduated in 2013. As shown in Table 1, students in questions 3, 4, 5, 6, 11 and 22, giving the highest score and in the questions 2, 12, 13, 14, 23, 24, 25 and 26 giving the lowest points to their performance (table 1). Also in evaluation of mean of self-assessment of participants in study were observed based on the gender that men group concerning the proper placement of film in bitewing technique significantly ($P=0.03$) higher than women group. In relation to putting the film in correct position on bitewing radiography, male graduates have attained higher scores than female graduates ($P= 0.03$).

Table 1: self - assessment of participants according to the questions

	Frequency (percent)	Very high	high	Intermediate	Weak	Very weak	Average \pm Standard deviation(Sd)
Questions							
1	I am familiar with all intraoral radiography techniques	13 (20.6)	31 (49.2)	18 (28.6)	1 (1.6)	0	3.88 ± 0.74
2	I am familiar with all extra-oral radiographic techniques	0	18 (28.6)	31 (49.2)	14 (22.2)	0	3.05 ± 0.71
3	I can put film in the	26 (41.3)	28 (44.4)	9 (14.3)	0	0	4.26 ± 0.70

	correct position in the mouth in periapical radiographs						
4	I can properly adjust the vertical angle of tube in periapical radiographs	23 (36.5)	29 (46)	11 (17.5)	0	0	4.1 ± 0.71
5	I can properly adjust the horizontal angle of tube in periapical radiographs	21 (33.3)	28 (44.4)	14 (22.2)	0	0	4.11 ± 0.74
6	I can put the patient head in the correct position in periapical radiographs	26 (41.3)	30 (47.6)	7 (11.1)	0	0	4.30 ± 0.66
7	I can use the correct exposure time For Periapical radiography from various areas of the jaw	14 (22.2)	32 (50.8)	14 (22.2)	1 (1.6)	2 (3.2)	3.87 ± 0.88
8	I can put the film in the correct position in bitewing radiography	10 (15.9)	41 (65.1)	11 (17.5)	1 (1.6)	0	3.95 ± 0.63
9	I can properly adjust the vertical angle of tube in bitewing radiography	10 (15.9)	36 (57.1)	16 (25.4)	1 (1.6)	0	3.87 ± 0.68
10	I can properly adjust the horizontal angle of tube in bitewing radiography	7 (11.1)	35 (55.6)	20 (31.7)	1 (1.6)	0	3.76 ± 0.66
11	I can put the patient head in the correct position For bitewing radiography	20 (31.7)	30 (47.6)	11 (17.5)	2 (3.2)	0	4.07 ± 0.78
12	I can use the correct exposure time For bitewing radiography from various areas of the jaw	9 (14.3)	28 (44.4)	21 (33.3)	3 (4.8)	2 (2.3)	3.61 ± 0.90
13	I am familiar with the different methods of occlusal radiography	2 (3.2)	13 (20.6)	26 (41.3)	15 (23.8)	7 (11.1)	2.80 ± 0.99
14	I am familiar with the types of digital intraoral radiography sensors	3 (4.8)	13 (20.6)	21 (33.3)	16 (25.4)	10 (15.9)	2.73 ± 1.11

15	I can read ordered X-ray well	17 (27)	27 (42.9)	13 (20.6)	6 (9.5)	0	3.87 ± 0.92
16	I am familiar with doing infection control in maxillofacial radiography	14 (22.2)	34 (54)	12 (19)	3 (4.8)	0	3.93 ± 0.78
17	I am familiar with the administration cases of intraoral radiography.	19 (30.2)	33 (52.4)	6 (9.5)	2 (3.2)	3 (4.8)	4.00 ± 0.98
18	I am familiar with the administration cases of extra-oral radiography.	14 (22.2)	19 (30.2)	25 (39.7)	3 (4.8)	2 (3.2)	3.63 ± 0.98
19	I know the anatomical characteristics of intraoral radiography	10 (15.9)	39(61.9)	13 (20.6)	1 (1.6)	0	3.92 ± 0.65
20	I know the anatomical characteristics of extra-oral (panoramic) radiography	8 (12.7)	32 (50.8)	21 (33.3)	2 (3.2)	0	3.69 ± 0.81
21	I know the technical errors in intraoral radiographs and I can fix it in next stereotype	6 (9.5)	37 (58.7)	17 (27)	3 (4.8)	0	3.73 ± 0.7
22	I know the correct method of film processing manually	24 (38.1)	25 (39.7)	9 (14.3)	4 (6.3)	1 (1.6)	4.06 ± 0.96
23	I can interpreted the radiolucent lesions in intraoral and extra-oral radiography	5 (7.9)	22 (34.9)	22 (34.9)	11 (17.5)	3 (4.8)	3.28 ± 1.05
24	I can interpreted the radiopaque lesions in intraoral and extra-oral radiography	2 (3.2)	20 (31.7)	25 (39.7)	12 (19)	4 (6.3)	3.07 ± 1.02
25	I can interpreted the radiopaque -radiolucent lesions in intraoral and extra-oral radiography	1 (1.6)	15 (23.8)	29 (46)	14 (22.2)	4 (6.3)	2.92 ± 0.88
26	I can differential diagnosis about the lesions observed in X-rays	1 (1.6)	9 (14.3)	25 (39.7)	24 (38.1)	4 (6.3)	2.68 ± 0.89

Table 2 showed that the group that had GPA over 17 obtained significantly higher scores in questions which related to technical errors in intraoral radiography, the interpretation of lesions radiolucent, radiopaque, radiolucent-radiopaque radiography and differential diagnosis of lesions (21, 23, 24, 25, 26).

Table 2: average of self - assessment of participant in study and according to GPA

question	average	Average±Standard deviation(Sd)	At least	maximum	p-value
I know the technical errors in intraoral radiographs and I can fix it in next stereotype (Question 21)	11 – 13.99	3.75 ± 0.50	3	4	0.01
	14 – 16.99	3.60± 0.67	1	5	
	17- 20	4.27 ±0.64	3	5	
I can interpreted the Radiolucent lesions in intraoral and extra-oral radiography (Question 23)	11 – 13.99	2.75 ± 0.50	2	3	0.03
	14 – 16.99	3.16 ± 1.09	1	5	
	17- 20	4.00 ± 0.63	3	5	
I can interpreted the Radiopaque lesions in intraoral and extra-oral radiography (Question 24)	11 – 13.99	2.75± 0.50	2	3	0.02
	14 – 16.99	2.93± 1.03	1	5	
	17- 20	3.81±0.75	3	5	
I can interpreted the Radiopaque- Radiolucent lesions in intraoral and extra-oral radiography (Question 24)	11 – 13.99	2.75 ± 0.50	2	3	0.03
	14 – 16.99	2.79 ± 0.92	1	5	
	17- 20	3.54±0.52	3	4	
I can differential diagnosis about the lesions observed in X-rays	11 – 13.99	2.50 ± 0.57	2	3	0.01
	14 – 16.99	2.54 ± 0.87	1	5	
	17- 20	3.36 ± 0.80	2	4	

4. Discussion

The study shows that self-assessment results of graduating are good in terms of oral and maxillofacial radiology and about the technical skills of this part. Education evaluation in various fields of science especially medical science is important and has especial sensitivity. To achieve the educational goals it is necessary that the educational situation continuously evaluate and identify the strengths and weaknesses. Self-assessment study is the reliable tool for evaluating the effectiveness of training program [7]. From the response of participants found

that the students' satisfaction about their ability is not related to their gender which are consistent with Jabarifar [1] and Babaei [8] study. The results of the study showed that capabilities of women were higher than men [9]. The results of some studies showed that women have lower self-confidence than men and so they consider their performance lower than actual [10,11]. This could be due to this belief that male students learned the clinical skills effectively.

The results showed that students had more satisfaction in the practical department of oral and maxillofacial radiology than theoretical lessons that are compatible with Schönwetter study. In that study, students had the highest rate of clinical training [12]. The results showed that students who had higher average scores are more satisfied that are not consistent with the results of Babaei study which were done on students in 4, 5 and 6 years of their course, [8] but is consistent with the results of Donald and Fitzgerald research. In these two studies final grade were used and there is a moderate positive correlation between their final grade and their self-assessment score [13,14]. Using final score of students instead of their GPA could obtain more accurate results but Stacey study showed that students' scores on the exams are significantly less than self-assessment score [15]. Therefore, the mean scores of the participants were used in this study.

5. Conclusions

Based on the results of research and discussion, it can be concluded that students had more satisfaction in the practical department of oral and maxillofacial radiology than theoretical lessons. Also the results showed that students who had higher average scores are more satisfied.

References:

- [1] Jabarifar SE, Khoroushi M, Shamir Homeyra, et al 2012, Graduated Dental Students Self-Assessment of Clinical Competencies at Isfahan in 2011. *Iranian Journal of Medical Education* ,Vol.11, No.9, Pp.1359-1365.
- [2] Wanigasooriya N 2004, Student self-assessment of essential skills in dental surgery. *British dental journal*, Vol.197 , No.3, Pp 11-14.
- [3] Cabot L, Radford D 1999, Personal view: Are graduates as good as they used to be? *British dental journal*, Vol.186 , No.7, Pp 318-319.
- [4] Chambers DW, Gerrow JD 1994, Manual for developing and formatting competency statements. *Journal of dental education*, Vol.58 , No.5, Pp 361-366.
- [5] Plasschaert A, Boyd M, Andrieu S, et al 2002, Development of professional competences. *European Journal of Dental Education*, Vol.6 , No.3, Pp 33-44.
- [6] Miettinen R 2000, The concept of experiential learning and John Dewey's theory of reflective thought and action. *International Journal of Lifelong Education*, Vol.19 , No.1, Pp 54-72.

- [7] Greenwood L, Lewis D, Burgess R 1998, How competent do our graduates feel? Journal of dental education, Vol.62 , No.4, Pp 307-313.
- [8] Babaee N, Jahanian I, Bijani A, et al 2014, Viewpoints of Dental Students about Practical Value of Educational Contents in Oral Medicine Department. Biannual J of Med Edu;Education Development Center;Babol Univ of Med Sci.Vol.2, No.1, Pp 35-40.
- [9] Rafeek RN, Marchan SM, Naidu RS, et al 2004, Perceived competency at graduation among dental alumni of the University of the West Indies. Journal of dental education , Vol.68 , No.1, Pp 81-88.
- [10] Karaharju-Suvanto T, Näpänkangas R, Koivumäki J, et al 2014, Gender differences in self-assessed clinical competence—a survey of young dentists in Finland. European Journal of Dental Education, Vol.92 , No.10, Pp 218-224.
- [11] Mould MR, Bray KK, Gadbury-Amyot CC 2011, Student Self-Assessment in Dental Hygiene Education: A Cornerstone of Critical Thinking and Problem-Solving. Journal of dental education , Vol.75 , No.8, Pp 1061-1072.
- [12] Schönwetter D, Law D, Mazurat R, et al 2011, Assessing graduating dental students' competencies: the impact of classroom, clinic and externships learning experiences. European Journal of Dental Education , Vol.15 , No.3, Pp 142-152.
- [13] Curtis DA, Lind SL, Dellenges M, , et al 2008 , Dental students' self-assessment of preclinical examinations. Journal of dental education, Vol.72 , No.3, Pp 265-277.
- [14] Fitzgerald JT, White CB, Gruppen LD 2003, A longitudinal study of self-assessment accuracy. Medical Education, Vol.37 , No.7, Pp 645-649.
- [15] Stacey M, Morgan M, Wright C 1998, The effect of clinical targets on productivity and perceptions of clinical competency. Journal of dental education , Vol.62 , No.6, Pp 409-414.